

DIAPHRAGM N-DECK

SCREW ATTACHMENT



N-Deck 32/3 Screw Pattern

Support fastening	AISI #12 screws or equivalent
Side-lap fastening	AISI #10 screws or equivalent

F_u	60 ksi
F_y	50 ksi
F_{xx}	60 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.70	2.30
Wind	0.80	2.00
Other	0.70	2.30

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nr} , plf ^{1,2}									K_1 1/ft
		Span, ft.									
		8	8.5	9	9.5	10	10.5	11	11.5	12	
3DR22 0.0295" 32/3	2	280	260	245							0.537
	3	335	315	305	290	275	265	250	240	230	0.419
	4	380	365	345	335	320	305	295	285	275	0.343
	5	420	405	390	375	360	345	330	320	310	0.291
	6	460	440	425	410	395	380	365	355	345	0.252
	7	490	475	455	440	425	410	400	385	375	0.223
	8	520	500	485	470	455	440	430	415	405	0.199
	9	545	525	510	495	480	470	455	440	430	0.180
	10	565	550	535	520	505	490	480	465	455	0.165
	11	585	570	555	540	525	515	500	490	475	0.152
	12	600	585	575	560	545	535	520	510	495	0.140
	l, in4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf									
0.808	6643	5884	5249	4711	4252	3856	3514	3215	2952		

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nr} , plf ^{1,2}									K_1 1/ft
		Span, ft.									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
3DR20 0.0358 32/3	2	315									0.592
	3	385	370	350	340	325	310	300			0.461
	4	445	425	410	390	375	365	350	340	325	0.378
	5	495	475	460	440	425	410	395	385	370	0.320
	6	540	520	505	485	470	455	440	425	415	0.278
	7	580	560	545	525	510	495	480	465	450	0.245
	8	615	600	580	565	545	530	515	500	490	0.219
	9	645	630	610	595	580	565	550	535	520	0.199
	10	675	655	640	625	610	595	580	565	550	0.181
	11	700	680	665	650	635	620	605	590	580	0.167
	12	720	705	690	675	660	645	630	615	605	0.155
	l, in4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf									
0.989	7060	6337	5719	5187	4726	4324	3971	3660	3384		

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nr} plf ^{1,2}									K_1	
		Span, ft.										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	1/ft	
3DR18 0.0474 32/3	3	500	480	460	445	430					0.531	
	4	580	560	540	520	500	485	470	455	440	0.435	
	5	655	630	610	590	570	550	535	520	505	0.368	
	6	715	695	670	650	630	610	595	575	560	0.319	
	7	770	750	725	705	685	665	650	630	615	0.282	
	8	820	795	775	755	735	715	700	680	665	0.253	
	9	860	840	820	800	780	760	745	725	710	0.229	
	10	900	880	860	840	820	800	785	765	750	0.209	
	11	930	910	890	875	855	835	820	805	785	0.192	
	12	955	940	920	905	885	870	855	835	820	0.178	
	13	980	965	950	930	915	900	880	865	850	0.166	
	l, in4/ft		Nominal Shear Strength due to Panel Buckling, S_{nb} plf									
	1.323		8782	7966	7258	6640	6099	5620	5196	4819	4481	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nr} plf ^{1,2}									K_1	
		Span, ft.										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	1/ft	
3DR16 0.0598 32/3	3	805	770	735							0.596	
	4	990	945	905	870	835	805	775	750	725	0.488	
	5	1175	1125	1075	1035	995	955	925	890	860	0.414	
	6	1360	1300	1245	1195	1150	1110	1070	1030	995	0.359	
	7	1530	1480	1420	1360	1310	1260	1215	1175	1135	0.317	
	8	1530	1530	1530	1525	1465	1410	1360	1315	1270	0.284	
	9	1530	1530	1530	1530	1530	1530	1505	1455	1405	0.257	
	10	1530	1530	1530	1530	1530	1530	1530	1530	1530	0.234	
	11	1530	1530	1530	1530	1530	1530	1530	1530	1530	0.216	
	12	1530	1530	1530	1530	1530	1530	1530	1530	1530	0.200	
	13	1530	1530	1530	1530	1530	1530	1530	1530	1530	0.186	
	l, in4/ft		Nominal Shear Strength due to Panel Buckling, S_{nb} plf									
	1.672		10299	9423	8654	7975	7374	6838	6358	5927	5538	

	ϕ_{df}	Ω_{df}
Buckling	0.80	2.00

¹Nominal shear strength of bare deck shown above may be limited by shear buckling.

²Design Strengths: ASD Required strength (Service Applied Load) \leq Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$ • LRFD Required strength (Factored Applied Load) \leq Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

N-Deck 32/5 Screw Pattern

Support fastening	AISI #12 screws or equivalent
Side-lap fastening	AISI #10 screws or equivalent

F _u	60 ksi
F _y	50 ksi
F _{xx}	60 ksi

Loading	φdf	Ωdf
Seismic	0.70	2.30
Wind	0.80	2.00
Other	0.70	2.30

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S _{nr} , plf ^{1,2}									K ₁ 1/ft
		Span, ft.									
		8	8.5	9	9.5	10	10.5	11	11.5	12	
3DR22 0.0295" 32/5	2	320	300	285							0.441
	3	390	365	345	325	310	295	280	270	260	0.358
	4	460	430	405	385	365	350	335	320	305	0.301
	5	520	490	465	445	420	400	385	365	350	0.260
	6	575	545	520	495	470	450	430	415	395	0.229
	7	630	595	570	540	520	495	475	455	440	0.204
	8	680	645	615	590	565	540	520	500	480	0.184
	9	725	690	660	635	605	580	560	535	520	0.168
	10	770	735	705	675	650	620	600	575	555	0.154
	11	815	780	745	715	685	660	635	615	590	0.143
	12	855	820	785	755	725	700	675	650	625	0.133
		I, in4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf								
	0.808	6643	5884	5249	4711	4252	3856	3514	3215	2952	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S _{nr} , plf ^{1,2}									K ₁ 1/ft
		Span, ft.									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
3DR20 0.0358 32/5	2	360									0.486
	3	445	420	400	380	360	345	330			0.394
	4	525	495	470	450	430	410	395	375	365	0.332
	5	600	570	545	520	495	475	455	435	420	0.286
	6	665	635	605	580	555	535	515	495	475	0.252
	7	730	700	670	640	615	590	570	545	530	0.225
	8	795	760	725	695	670	645	620	600	575	0.203
	9	850	815	780	750	720	695	670	645	625	0.185
	10	905	870	835	805	775	745	720	695	670	0.170
	11	960	920	885	855	820	795	765	740	715	0.157
	12	1010	970	935	900	870	840	810	785	760	0.146
		I, in4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf								
	0.989	7060	6337	5719	5187	4726	4324	3971	3660	3384	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nr} plf ^{1,2}									K_1	
		Span, ft.										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	1/ft	
3DR18 0.0474 32/5	3	570	545	520	495	475					0.454	
	4	685	650	620	595	570	545	525	505	490	0.382	
	5	785	750	720	690	665	635	615	590	570	0.330	
	6	880	840	805	775	745	720	695	670	650	0.290	
	7	965	925	890	855	825	795	770	745	720	0.259	
	8	1050	1010	970	935	900	870	840	815	785	0.234	
	9	1130	1090	1050	1010	975	940	910	880	855	0.213	
	10	1205	1165	1120	1080	1045	1010	980	950	920	0.196	
	11	1280	1235	1190	1150	1115	1075	1045	1010	980	0.181	
	12	1345	1300	1255	1215	1175	1140	1105	1075	1040	0.168	
	13	1410	1360	1320	1275	1240	1200	1165	1130	1100	0.157	
		l, in4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb} plf									
		1.323	8782	7966	7258	6640	6099	5620	5196	4819	4481	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nr} plf ^{1,2}									K_1	
		Span, ft.										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	1/ft	
3DR16 0.0598 32/5	3	925	885	850							0.510	
	4	1115	1065	1020	980	940	905	875	845	815	0.429	
	5	1300	1240	1190	1145	1100	1060	1020	985	950	0.370	
	6	1485	1420	1360	1305	1255	1210	1165	1125	1090	0.326	
	7	1670	1600	1530	1470	1415	1360	1310	1265	1225	0.291	
	8	1855	1775	1700	1635	1570	1510	1460	1410	1360	0.262	
	9	2045	1955	1870	1795	1730	1665	1605	1550	1495	0.239	
	10	2230	2130	2045	1960	1885	1815	1750	1690	1635	0.220	
	11	2415	2310	2215	2125	2045	1965	1895	1830	1770	0.203	
	12	2600	2485	2385	2290	2200	2120	2045	1970	1905	0.189	
	13	2785	2665	2555	2450	2355	2270	2190	2115	2045	0.177	
		l, in4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb} plf									
		1.672	10299	9423	8654	7975	7374	6838	6358	5927	5538	

	ϕ_{df}	Ω_{df}
Buckling	0.80	2.00

¹Nominal shear strength of bare deck shown above may be limited by shear buckling.

²Design Strengths: ASD Required strength (Service Applied Load) $\leq \text{Min} \{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$ • LRFD Required strength (Factored Applied Load) $\leq \text{Min} \{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$